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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/754,220	01/05/2001	Benjamin Szu-Min Lin	NAUP0223USA	3364
27765	7590	01/11/2005	EXAMINER	
(NAIPC) NORTH AMERICA INTERNATIONAL PATENT OFFICE			DIMYAN, MAGID Y	
P.O. BOX 506			ART UNIT	PAPER NUMBER
MERRIFIELD, VA 22116			2825	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/754,220

Applicant(s)

LIN, BENJAMIN SZU-MIN

Examiner

Magid Y Dimyan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. This Office Action pertains to U.S. Patent Application No. 09/754,220 filed January 05, 2001. Claims 1 – 17 remain pending in this application.

### *Claim Objections*

2. Claims 1, 4, 6, 10, 11, 13, 14 and 16 are objected to because of the following informalities:

- Claim 1, line 2, delete “the photomask” and insert --a photomask--; line 3, delete “the optical” and insert --an optical--; line 8, delete “the image” and insert --an image--.
- Claim 4, line 2, delete “the slit” and insert --a slit--.
- Claim 6, line 2, delete “the photomask” and insert --a photomask--; line 7, delete “the image” and insert --an image--; line 13, delete “the image” and insert --an image--; line 18, delete “by the” and insert --by a--.
- Claim 10, line 4, delete “by the” and insert --by a--.
- Claim 11, line 2, delete “the slit” and insert --a slit--; line 4, delete “the slit” and insert --a slit--.
- Claim 13, line 6, delete “the image” and insert --an image--.
- Claim 14, line 3, delete “the proportional” and insert “a proportional”.
- Claim 16, line 2, delete “the slit” and insert --a slit--.

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3. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 – 17 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,171,731 to Medvedeva et al. (hereinafter, "Medvedeva").

6. Referring to claim 1, Medvedeva discloses an optical proximity correction algorithm used in the photomask pattern design of a semiconductor process to reduce the optical proximity effect when transferring the photomask pattern to the surface of a semiconductor wafer (see Figs. 1A, 1B, 2; col. 2, lines 6 – 33), the method comprising: (a) providing an original layout (Fig. 2, block 42); (b) analyzing the image condition by the operation of a reverse Fourier transformation on the original layout (Fig. 2; Fig. 3, block 44; col. 5, lines 50 - 59);

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(c) creating a modified layout to be formed on the photomask according to image conditions (Fig. 2, blocks 46 and 50); and (d) the modified layout is transferred from the photomask to the wafer by the lithographic process so that the wafer produces a pattern the same as the original layout (Fig. 2, block 48). Medvedeva thus cites all the claimed elements.

7. As to claim 2, see Fig. 10, which shows the CAD system used to perform the algorithm, as claimed.

8. As per claim 3, see Figs. 2 and 4; col. 5, line 24 – col. 6, line 53, which cite the effect of the exposure intensity and the use of the reverse Fourier transformation method in the computation of the image to be placed on the photomask, as claimed.

9. Referring to claims 4 and 5, see col. 2, lines 6 - 55, which teach the limitations of critical elements (i.e., slit geometry) in the modified layout, as well as the photoresist layer on the surface of the wafer used to fabricate the patterns, as claimed.

10. Referring to claim 6, Medvedeva discloses an optical proximity correction algorithm used in the photomask pattern design of a semiconductor design of a semiconductor process (see (4) above) comprising: (a) providing an original layout (see (4) above); (b) analyzing the image condition by the operation of a

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reverse Fourier transformation on the original layout (see (4) above); (c) creating a modified layout to be formed on the photomask according to image conditions (Fig. 2, block 50); (d) performing a second reverse Fourier transformation on the modified layout (see iteration in Fig. 2, blocks 44, 46 and 50; col. 5, lines 24 – 59); and (e) creating a photomask design pattern and using that photomask to fabricate the pattern on the semiconductor wafer via a photolithographic process (Fig. 2, block 48). Thus, Medvedeva recites all the limitations of this claim.

11. Claim 7 contains the same limitations as claim 2, and therefore the same rejections apply.

12. As per claim 8, see Fig. 10, block 560 which shows the input device used for inputting the original layout data, as claimed.

13. As to claim 9, see Fig. 10, which teaches the apparatus (i.e., computer system) used for implementing the reverse Fourier transformation method.

14. Claims 10, 11 and 12 contain the same elements found in claims 3, 4 and 5, respectively, and thus the same rejections apply.

15. Referring to claim 13, Medvedeva teaches a method of designing a photomask pattern (see (4) above) comprising: (a) providing a defined pattern to be formed on the surface of a wafer (see (4)); (b) operating a reverse

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computation on the defined pattern to obtain the image condition composed of the defined pattern (see Fig. 2; col. 5, lines 48 - 59); and (c) designing the photomask pattern according to the image condition (Fig. 2, block 48).

16. As to claim 14, see again Figs. 1A, 1B, which show how the pattern is transferred to the semiconductor wafer surface via a lithographic process, as claimed.

17. As per claim 15, see col. 5, lines 24 - 59, which teach the reverse Fourier transformation method for simulating the photomask pattern, as claimed.

18. Claims 16 and 17 contain the same elements as claims 4 and 5, respectively, and therefore the same rejections also apply.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Magid Y Dimyan whose telephone number is (571) 272-1889. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on (571) 272-1907.

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The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Magid Y Dimyan  
Examiner  
Art Unit 2825

myd  
13 December 2004

11-17

  
VUTHE SIEK  
PRIMARY EXAMINER